increases the gravity of both. Often the fœtus dies *in utero,* and miscarriage or premature labor takes place, or the child may die during birth or shortly afterward. The child also may be diabetic. The liquor amnii has been found increased, and in some instances also to contain sugar. The mother often dies of the disease, sometimes during pregnancy or in childbirth or shortly afterward.

Accordingly, a diabetic woman should not marry; or if married she should not become pregnant. In the event of a diabetic woman becoming pregnant or of a pregnant woman becoming diabetic, pregnancy need not be interrupted artificially unless some special indication arises. If the woman is safely delivered she should not nurse her child.

HYPERTHYROIDISM.

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A TYPICAL case of Graves' disease, with the cardinal and subsidiary symptoms all characteristically grouped, is diagnosticated without difficulty. In the pure type of the disease, the five cardinal symptoms occupy the foreground of the clinical picture with the various secondary functional manifestations present, but less constant and intense. The diagnosis becomes somewhat difficult if the secondary symptoms are predominant, with but one or two cardinal indications present. Most recent writers on the subject refer, with more or less emphasis, to this class of cases, and there is an apparent disposition to distinguish a mild and temporary from the essential or chronic form of Graves' disease. The attempt to draw a sharp line of distinction has little vindication from practical experience, since we are constantly observing a gradual transition and eventual termination of the mild in the severe and fully-developed disease. In the clinical valuation of the different grades of thyroid toxemia, or Graves' disease, the matter stands much in the same light as the inter-relationship of the glycosurias and diabetes. It is only in perspective that we are able to estimate whether a functional perversion is the expression of some essential malady, or merely a mild and transient reaction to irritation. The necessity for the proper recognition of these atypical forms of Graves' disease is great, in consideration of the fact that the disease, so far as we can now tell, is one and the same, whether we call it complete or incomplete—difference being a matter of degree only. Various names have been applied to these mild types of the disease. They have been designated "aberrant types," "pseudo-Graves'," "formes fruste," "larval types." The term "hyperthyroidism" has often been employed to characterize states of thyroid toxemia which are apparently less than Graves' disease. It is with these subtoxic states that the present paper is concerned.

The frequency of occurrence of morbid overactivity of the thyroid gland is probably much greater than is generally believed; for, with the present better appreciation of the nature of thyroid intoxication, many cases are being thus interpreted that in other times were probably passed over as instances of neurasthenia, hysteria, functional heart disease, anemia, etc. My own experience has brought to my attention with strong emphasis the importance of thyroid toxemia as a complicating element in clinical work.

The question of the pathogenesis of Graves' disease seems at last settled in favor of the theory of Möbius, which postulates an overactivity or perverted activity of the thyroid gland as the essential feature. The vasomotor, nervous, and cardiac symptoms are toxic phenomena, dependent on the presence in the blood of excessive amounts of thyroid secretion or of thyroid secretion of abnormal quality. The primary cause of the thyroid disturbance is still left unexplained, although there seems little doubt that it is a toxic reaction, dependent on some morbid material as yet unidentified. The whole structure of the surgical treatment of Graves' disease rests upon the theory of hyperthyroidism, and if it be not true, then the hundreds of thyroidectomies which are now matters of record remain without justification. The striking influence over the disease, which follows a well-executed partial thyroidectomy, furnishes evidence in favor of the theory of hyperthyroidism, which is so direct as to be apparently irrefutable. The rapidly accumulating surgical records in Graves' disease furnish a clinical document that has few parallels in the history of modern medicine.

The results of thyroid feeding supply evidence which is hardly less conclusive. The administration of thyroid gland substance, or thyroid extract, is capable, if given in sufficient amount, of inducing a toxic state, which in almost every essential is similar to Graves' disease. An artificial state of hyperthyroidism is thereby produced, which duplicates almost in full the morbid syndrome. Even the characteristic exophthalmic symptoms have been observed after thyroid feeding by Auld, Béclere, and others, and Edmunds was able to induce proptosis, widening of the palpebral fissure, and dilatation of the pupils, in six monkeys, by this means, even after excision of a portion of the cervical sympathetic.

The following clinical instance of artificial thyroid toxemia constitutes a striking example of the effect upon the human: My patient is a young man, aged twenty-two years. He was referred to me for general examination by Dr. Thomas A. Woodruff, of Chicago, who had found low grade degenerative changes in the choroid, such as are produced by the chronic intoxications. Omitting all details of the case, which have no bearing on the purpose of the present citation, it will suffice to state that the patient has a small, simple goitre, which has existed without symptoms since childhood. A few weeks before examination he experienced for the first time a sense of swelling and constriction of the throat, excessive sweating, and a good deal of restlessness and general nervousness. Examination revealed a well-developed thyroid toxemia, marked by restlessness, hyperidrosis, exaggerated reflexes, tachycardia (pulse 100 to 126), excessive pulsation of the carotids and femorals, fine tremor of the hands, tongue, and closed eyelids. There was no exophthalmos. It appeared that four months before the date of consultation, he had been induced to take thyroid extract to remove his goitre, and, not observing any effect upon the tumor, had gradually and steadily increased the dosage, believing the stuff harmless. From 15 grains daily—the initial dose—he had attained an average of 75 grains a day, and affirmed that he had taken 200 5-grain tablets (1000 grains) during the preceding week. The maximum daily quantity taken on any one day was 150 grains. Strange to say he had gained perceptibly in weight during the time he took the preparation. Discontinuance of the drug, under my directions, resulted in a prompt subsidence and final disappearance of the toxic symptoms.

The exact part that the thyroid plays in systemic metabolism is, unfortunately, still largely a matter of conjecture. Certain empirical physiological facts have been accumulated by clinical observation, which apparently have a bearing on the incidence of thyroid functional perversions. That the gland exerts an influence on the development of the organs of generation of both sexes and is affected by the vicissitudes of the sexual life of the individual, is demonstrated by many observations. The asexuality and infantilism of cretins and the different cretinoid states is well known. The intimacy of relationship between the thyroid and the generative organs is much greater in the female than in the male, probably owing to the recurring functional demands of menstruation, pregnancy, and lactation, and we consequently encounter thyroid disturbance with much greater frequency in women than in men. In many women the thyroid enlarges at the first menstruation, and at each subsequent period, producing at times an appreciable enlargement. It is stated that in girls the commencement of the sexual life is accompanied by an enlargement of the thyroid, and the gland has been observed to enlarge during rut in the cat, rat, sheep, and deer. Suppression of the menses may produce an enlargement of the thyroid, which subsides on their re-establishment. It is stated by Richardson that in Southern Italy it has long been the custom for the parent to measure carefully the circumference of the daughter's neck before and after marriage—an increase in size being considered an evidence of pregnancy. Thus the thyroid gland is subject to congestion and functional hypertrophy under the normal conditions of puberty, menstruation, marriage, and pregnancy. Although physiological in their inception, these thyroidal disturbances may at any time, under persistent or excessive stimulation, pass the borderline and become pathological, causing symptoms of the Graves type.

The following instances from my case records exemplify this transformation: A little girl, aged eleven years, was brought for examination by her mother, who was concerned over an enlargement of the child's neck which had appeared in December last. Menstruation had occurred first in February, two months after the appearance of the goitre, and again in March and April. It had been observed that the tumor was larger at the menstrual periods than at other times. On examination it was found that in addition to a small bilateral goitre, there was a well-marked fine tremor of the hands and slight irregular twitching of the extremities, sweatings, flushings, morbid blushing, general nervousness, and mental depression. The pulse was persistently above 100; temperature 99.5°. It is interesting to note the fact that in this case the thyroid enlargement antedated puberty. Broca and Richardson suggest that as the thyroid apparently presides over the development of the generative organs, its failure to secrete being marked by infantilism and sexual involution, it might be serviceable to administer thyroid gland substances in cases of delayed puberty.

Another case of somewhat different character and greater interest is that of a young lady of Syrian birth, now nineteen years of age. I might note the fact in passing that, after a considerable experience during three years' work among the Syrian colony in Chicago, more than one-half the women of this nationality I have seen have enlarged thyroids. They are otherwise normal and well developed. The girl under reference has had a small-sized simple goitre since early childhood. Three months previous to consultation she began to experience backache, dizziness, palpitations, dyspnœa, hot flushes, sweatings, insomnia, and gradually lost in body weight. Menstruation since fourteen; regular, but scant. Examination revealed marked throbbing of the neck vessels and abdominal pulsation, exaggerated reflexes, dermographia, moist skin, fine tremor of the hands, lid, and tongue tremor. Blood examination showed slight anemia; urine normal. During ten weeks' observation, the pulse was never observed below 100. Average systolic blood pressure, 100 mm. (Stanton). At the end of this period of observation the patient married. Within a week after marriage all symptoms had abated, and she rapidly put on flesh, regaining all her lost weight (eight pounds). She remained entirely free from the former troublesome symptoms for two months when she became pregnant. This has had the effect of causing a reappearance of the thyroid toxemia. The rapid disappearance of toxic symptoms after marriage, it seemed to me, very evidently indicated that the nervous stress and sexual stimulation of courtship were the exciting factors in causing hyperthyroidism. Re-appearance of the symptoms with the advent of pregnancy is not surprising, as we well know that during pregnancy there is a marked increase in thyroid activity. Freund observed augmentation in the size of the gland in 45 of 50 pregnant women, and Lange in 108 of 133 cases examined. In myxedematous women a marked improvement during pregnancy has been observed—the increased thyroid secretion being utilized by the mother to the probable detriment of the child. The functional stimulation of the thyroid incident to pregnancy usually extends throughout lactation, at the end of which period this physiological hypersecretion subsides without detriment to the gland. Occasionally it may serve as the starting point of a genuine Graves' disease, or, on the other hand, excessive thyroid involution may result, producing myxedema. Rapidly succeeding pregnancies with their attendant lactations, are particularly hazardous to the welfare of the gland.

The following case is cited from personal observation: A woman, now thirty-six years of age, has been married eight years, and during the first six years of her married life had five successful pregnancies, one a twin birth. She has always done her own housework and nursed her children. She observed a swelling of the neck four years ago. She complained of early and excessive fatigue on exertion, poststernal heaviness, frequent palpitation, dyspnœa on effort, evening malleolar œdema, sweating, backache, anorexia, excessive urine, and frequent micturition. Menstruation regular. Physical examination showed a pulse of 118; reacting excessively to effort and change of position. Systolic blood pressure, 135 mm.; diastolic, 105 mm. (Stanton). Exaggerated knee-jerks; moist skin; fine rhythmical tremor. There is distinct cardiac enlargement; no exophthalmos. A small uniform bilateral goitre exists.

One of the cases cited represents the type of thyroid toxemia arising in the presence of a simple goitre of long standing. It is far from uncommon to observe transient periods of tachycardia, tremor, sweating, and emotionalism in cases of ordinary goitre. Bloodgood[1] has recently called attention again to this association. Rarely in this group do we observe exophthalmos, the toxemia being manifested by nervousness, tremor, and tachycardia. These symptoms have been observed in simple goitre, thyroid cysts, adenoma, carcinoma, and tuberculosis of the gland. These toxic outbursts are usually comparatively mild, but are undoubtedly of the nature of Graves' disease. Bloodgood states that, as a rule, in cases of this character one will find cellular changes in the thyroid tissue identical with those of Graves' disease. Appreciation of the true significance of these toxic symptoms is of much practical importance to the surgeon. Cases of goitre of whatsoever form, which exhibit symptoms of this character, are to be operated upon with caution, owing to the greatly increased liability to the development of post-operative thyroidism in such subjects. Clinical observations of this character certainly furnish a very strong presumption in favor of the identity of hyperthyroidism and Graves' disease—the difference being mainly a question of dosage.

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[1] Surgery, Gynecology, and Obstetrics, August, 1905.

In addition to the foregoing types of hyperthyroidism, which are physiological in their inception, there are met with at least two other forms of thyroid hyperactivity, which are secondary to definite pathological states elsewhere in the economy. In many cases of valvular heart disease, particularly lesions of the mitral valve, whether primary or secondary to myocardial weakess, the thyroid may undergo enlargement from venous engorgement, and symptoms of hyperthyroidism may result. Much practical difficulty may arise in the more pronounced instances of this character in determining whether the thyroid enlargement and toxemia are the result of the valvular lesion, or its cause.

Another type of hyperthyroidism of great clinical interest is toxic hyperthyroidism. The simplest variety of this class of cases is the fulness of the neck, palpitations, tremors, sweatings, and depression, so frequently observed during the course of the anemias. Most cases of pronounced chlorosis are accompanied by some manifestation of this nature. In those of highly nervous temperament, especially women of hysterical tendencies, any form of systemic toxemia may awaken a morbid degree of activity in the thyroid, manifested by fulness of the neck and the characteristic vasomotor and nervous phenomena. Digestive toxemia, syphilis, diabetes, Bright's disease, may be so accompanied. I cite the following instance of its association with Bright's disease. There is not lacking an hereditary and personal predisposition to thyroid perversion in this patient. A sister died of Graves' disease and cardiac dilatation under my observation, and the patient gives a history of a year's ill-health at the age of eighteen, characterized by dyspnœa, palpitations, and obscure nervous manifestations. She remained in good health until four years ago, when albuminuria developed and chronic nephritis was diagnosticated. The case has been a high blood pressure one, with polyuria, dyspnœa of effort, but never any œdema or uremia. Four months ago a goitre appeared and has persisted, at the present time constituting a moderate-sized bilateral tumor. Rapid loss of weight followed—until the deficit amounts to 61 pounds (from 165 to 104 pounds). There was sweating, palpitation, pigmentation of the surface, tremor, morning headaches, and mental depression. No exophthalmos exists. The fundus oculi shows choroidal degenerative markings and vascular alterations. The heart is markedly enlarged, a faint systolic whiff is audible in the mitral area. The pulse varies from 110 to 130, very irregular in rhythm. Blood pressure: systolic, 165 mm.; diastolic, 100 mm. (Stanton). The urine shows a considerable albuminuria, and degenerative renal products.

Tuberculosis is frequently accompanied by symptoms which strongly suggest a thyroid source, and, in practical experience, it is not uncommon to meet with mild hyperthyroidism during the incipient stages of the disease. The two conditions resemble each other not a little, having in common slight pyrexia, sweating, flushing, increased reflexes, rapid pulse, and decline in body weight. It is not unlikely that many cases of hyperthyroidism in which no actual thyroid enlargement exists are wrongfully suspected of being incipient tuberculosis. The mistake is a natural one at a stage when sputum is not available for bacteriological diagnosis. A misjudgment in the opposite direction would be a much more prejudicial clinical error. How difficult the problem may be is illustrated by the following case: A young woman, aged twenty-two years, by occupation a clerk, consulted me several months ago. There is a good family and personal history; hygienic surroundings are average, although her occupation is confining. One year previously she had an acute infection of unknown character, marked by repeated chills and pyrexia, and it is from this attack that she dates her ill-health. Since then she has been weak and nervous, has troublesome hot flushes and hyperidrosis, so that she is constantly wiping her face and hands. There is troublesome palpitation, insomnia, headache, backache, dyspnœa, sternal pain and weight, and a slight hacking cough in the morning. Menses irregular. Steady decline in weight. There is an afternoon temperature varying from one-half to one degree above normal, increased by bodily activity and slightly greater during menstrual periods.

Examination shows a slightly enlarged heart and faint systolic bruit. There is a slight fulness of the neck; the pulse varies from 100 to 130. Average systolic blood pressure, 120 mm. (Stanton). There is well-marked fine muscular tremor of the hands and eye lids. Urine normal. Blood examination shows slight simple anemia. The sputum, which is scant, was examined several times with negative results. I would have been inclined to regard this case as the hyperthyroidism of menstrual irregularity in an hysterical woman had it not been for a small area in the upper part of the left lung, which left a doubtful impression on examination. Close observation of this focus covering a period of two months enabled me to watch its development into a typical area of tuberculous involvement.

It is not at all improbable that the thyroid secretion plays a part in the resistance offered by the organism against acute infectious diseases. We may infer as much from the frequency with which swelling of the gland is observed in acute infections of microbic origin. Statistics are not wanting in this connection.

Vincent[2] draws attention to painful swelling of the thyroid in 50 per cent. of his cases of acute articular rheumatism with fever.

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[2] Bulletin et Memoirs Soc. Méd. de Paris, 1906, xxiii, 598.

The swelling is most marked at the outset, and when the gland is not spontaneously painful it is tender to pressure. The swelling and tenderness disappear with improvement of the general symptoms. Vincent does not regard this as in any way peculiar to rheumatism, as it occurs in other infections as well. He has found the same thing in 11 of 17 cases of typhoid fever, in 1 of 4 cases of meningitis, in 7 of 15 cases of measles, in 9 of 19 cases of scarlet fever, in 1 of 9 cases of mumps, in both of 2 cases of erythema nodosum, and in 2 of 5 cases of acute malaria. These observations would certainly lead us to believe that the thyroid plays a part in the defence of the organism against acute microbic processes, and to infer that the gland is stimulated to increased physiological activity by toxins which its secretion is in some way destined to neutralize (Marin).

A possible sidelight on the connection between hyperthyroidism and Graves' disease is forthcoming from a consideration of the following statistics of the association of acute rheumatism and Graves' disease: Robinson[3] reports 127 cases of Graves' disease, 18.9 per cent. of which gave a definite previous history of acute rheumatism. West, in 1886, reported 38 cases of Graves' disease, 8 of which had a history of acute rheumatism. In 1890, MacKenzie collected 40 cases, 9 of which gave a history of quinsy and 5 acute rheumatism. In 1893, Thompson reported 8 cases of Graves' disease, 3 of which had had acute rheumatism. In view of these suggestive figures, taken in connection with the statistics of Vincent, it is incumbent on us to investigate the personal history of every case that comes under observation with especial reference to preceding acute infections. We are coming more and more to realize the deleterious late after-effects of acute microbic infections. The offence which is offered to the systemic tissues by the severe infectious toxemias is not one which is quickly condoned. We are much too apt to minimize the etiological importance of acute infections occurring in the antecedent history of patients who are suffering from obscure organic dystrophies and nutritive disorders. Many cases of organic disease of the liver, kidneys, vascular system and heart, as well as cases of diabetes and the essential anemias, can, with a fair degree of certainty, be traced back to an acute infection occurring, perhaps, many years previously. In consideration of the prominent part played by the thyroid in the resistance of the organism to acute disease, and the frequency of severe congestions of the gland, as shown by the observations of Vincent, we may, with reason, hypothesize some connection between acute microbic infections and Graves' disease. A severe toxic hyperthyroidism or a prolonged functional strain upon the organ, such as results from repeated pregnancies, anemia, etc., may beget a morbid irritability of the thyroid, which merely awaits the exciting factor of a sudden functional demand, resulting from shock, fright, or severe emotional disturbance, to establish the pathological type of thyroid overactivity known as Graves' disease. A careful, systematic inquiry into the previous history of every case of Graves' disease, with a view to tabulating the acute infections, neuropathical disturbances, anemias, menstrual disorders, etc., might yield suggestive data toward a better understanding of the etiology of this obscure disease.

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[3] Lancet, 1906, i, 1037.

PYELONEPHROSIS OF A SUPERNUMERARY KIDNEY.

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Mr. C., a medical student, aged twenty-three years, entered the Carney Hospital in September, 1906. Ever since he was three months old a swelling, the size of a hen's egg, had been observed in the left lower quadrant of his abdomen. From his third to his eighteenth year he had frequent attacks of "indigestion" following indiscretions in diet. The symptoms of these attacks were general abdominal pain, vomiting, and fever, and a tumor would appear in the left lower quadrant, last three or four days, and disappear when the bowels moved. During the last five years he has been free from attacks of this character. Four months before he came to Boston, after an illness of four days, he entered a hospital in a neighboring city. He complained then of headache, fever, malaise, constipation, and dull, bearing-down pains over the bladder. He had no vomiting or chills. A large globular mass was felt rising above the pelvis nearly to the level of the umbilicus. This tumor resembled a distended bladder, but when the latter was catheterized, the tumor merely sank back toward the sacrum. It was tender to pressure, especially to the left of the median line. There was some spasm of the rectus. There was a leukocytosis of 12,000, but a differential blood count proved negative. At the operation the surgeon found a cyst-like globular mass, the size of a child's head, situated in the position of a distended bladder. The bladder itself could be felt low down in the pelvis to the right of the tumor. The latter was free on all its surfaces except on the left, where it appeared to be adherent to the lateral pelvic wall. There was no connection between the tumor and the colon, sigmoid, or rectum. On aspiration 22 grams of an odorless, puriform fluid was withdrawn. This was reported to contain vacuolated organisms. The cyst-like tumor was opened and then packed with iodoform gauze; the